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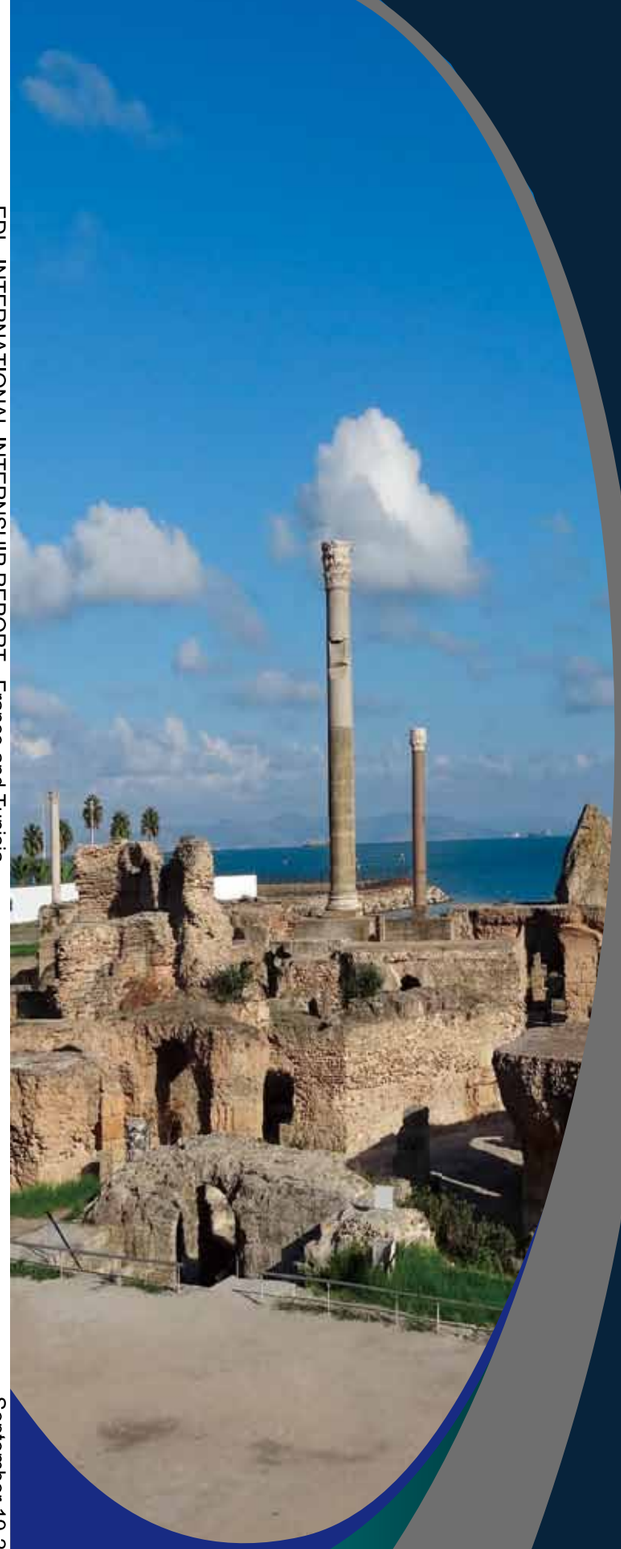
EDL INTERNATIONAL INTERNSHIP REPORT France and Tunisia

September 19-26, 2013



Environmental Diplomatic Leader
(EDL) Education Program

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This internship was held with the support of the funds for integrated promotion of social system reform and research and development by Ministry of Education, Culture, Sports, Science and Technology - JAPAN.

PREAMBLE

Major objectives of the EDL internship to France and Tunisia 2013

－Why we visited France and Tunisia? －

Pr. Naomi Wakasugi

To remind everyone of the overall objective of this internship, I should mention why I chose France and Tunisia as the countries to visit. There are several reasons.

First, I wanted our students to experience two countries; not one, two, a so-called developed country and a developing country, or two continents Europe and Africa. Moreover, these countries are closely related historically. Tunisia was a French colony between 1881 and 1956. So most Tunisian people speak French and received their education at school in French. Tunisia has of course its own long history and rich culture and traditions but at the same time France has somehow influenced its society. In fact, we visited Bizerte to see the Ichkeul ecosystem, however I did not know that Bizerte was the site of the last battle to finally evict the French army from Tunisia in 1963.

The second reason was a personal one. I spent eight years in Paris for Immunology research when I was a young researcher. France holds many memories of mine and I know it rather well. This is why I wanted everyone to see Paris and I thought I could introduce it well to you.

Thirdly, in France it is possible to visit important head offices of international organizations/ institutes such as UNESCO and the Pasteur Institute that work on issues very much related to Life and the Environment, and thereafter in Tunisia visit places related to ecosystem/ biodiversity, water issues and public health. Students will describe details of our visit and Dr.Chekirbane will give his thoughts about the objective and the meaning of the Tunisia internship in the Preface of this report.

Another objective of our group travel was not related to visiting countries but with ourselves, with how much we could grow by this experience. In preparatory study meetings I told everyone that the basis of being “diplomatic” is the ability to become a friend, which is not always easy. In particular, travel in a group of students with diverse backgrounds to different cultures and countries require a lot of effort and will finally train and develop the participants. I asked internship participants to “be independent, be cooperative and be constructive” and to “take care of not only yourself but also others and the whole group”.

I found you were always as expected and I believe that you succeeded in growing through participation in this internship. Congratulations!

Preface

There is an old Arabic and Islamic proverb which says: « *Search the knowledge even in China* »; the meaning is to encourage searching wisdom regardless distance and difficulties.

The EDL Program didn't save any effort to give the opportunity for its participants to discover very far horizons from Japan and Asia in general. In this framework, an international internship in France and Tunisia was organized by EDL in September 2013. The mean goal for the internship in Tunisia was to understand the relationship between water, ecology and health in a sub-humid and semi-arid environment. Water is a cross-cutting theme linking nearly all major global health challenges, including biodiversity conservation, climate change, poverty alleviation, and infectious diseases. The case study, the field visits and the discussions with the different stakeholders involved in the mentioned subject were selected to allow to the participants to have a concrete image about the cycle water – ecology – health. The most upper part of Tunisia including Ichkeul watershed and the Kroumirie region was a suitable choice to observe how water resources management, via the social and ecological dimensions, affects the ecosystem equilibrium and diseases categorized as waterborne.

We believe that our objective was reached because of the positive feedbacks and impressions of the visited Tunisian institutions and decision-makers and obviously thanks to the respectful scientific and communication level of the EDL participants.

Dr. Anis Chekirbane
Senior EDL & Assistant Professor in
CERTE, Tunisia

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3. Chapter 3 : Individuals Internship Appraisals

Chapter 1: Internship outline

1.1 List of Participants

Professors:	1.	Prof. Naomi Wakasugi	JAPAN
	2.	Prof. Jamila Tarhouni	TUNISIA
	3.	Prof. Takahiro Endo	JAPAN
Assistants:	1.	Mr.Akihiko Yahata	JAPAN
	2.	Michiyo Takeuchi	JAPAN
	3.	Dr. Anis Chekirbane	TUNISIA
Students:	1.	Aleksejeve Jelena	LATVA
	2.	Bui ThiTuyet Van	VIET NAM
	3.	Din Jielu	CHINA
	4.	Ding Dahu	CHINA
	5.	Erdenebadrakh Munkhjargal	MONGOLIA
	6.	MianMdTofail	BANGLADESH
	7.	Nguyen Thi Tam	VIET NAM
	8.	Nurymkhan Marjangul	MONGOLIA
	9.	Yang Wei	CHINA

Participants of EDL internship 2013, France and Tunisia

1. 2 Trip schedule

Date	Time	Activity
Sep 19th (Thu)	06:00	Tsukuba Bus Center
	08:00-10:00	Tsukuba to Narita Airport (by bus)
	11:55-17:15	Narita Airport (AF275) to Paris CDG Airport
	18.00-19.30	Paris CDG Airport to First Hotel (by bus)
Sep 20th (Fri)	09:45-10:00	Arrival at UNESCO Fontenoy & Entry into the building
	10:00-12:00	Lecture on "Water Quality for Human Well-being and Environment: A Key Challenge to Water Security
	12:00-12:30	A guided tour of the UNESCO Fontenoy building
	14:30-16:00	Paris Water Authority A short presentation on Paris water services and the re-municipalization of water utilities.
	16:00-17:00	Visit Pavillon de l'Eau Museum Guided tour of the Paris Water Museum.
	17:00-19:00	Visit to Pasteur Institute Special exposition celebrating a France-Vietnam joint issue of a new stamp of Alexandre Yersin.
Sep 21th (Sat)	09:00-15:30	Sightseeing in Paris
	17:00-13:00	First hotel to Paris CDG Airport (by bus)
	21:05-22:35	Paris CDG Airport (AF1784) to Tunis Carthage Intl. Airport
	22:35- 23:30	Tunis Carthage Int. Airport to Hotel in Tunis: Le Belvédère (by bus)
Sep22th (Sun)	09:00-12:00	INAT, Tunisia Seminar and meeting.
	14:00-17:00	Visit to the archeological site of Carthage
Sep23th (Mon)	08:00-08:30	Departure from Belvédère Hotel
	09:00-12:00	Visit of "Ichkeul" ecosystem (UNESCO World Heritage Centre)
	12:30-14:00	Visit to High Institute of Fisheries and Aquaculture in Bizerte
	14:30-17:00	Visit to Sidi El Barrak dam.
	17:00-18:30	Arrival at Hotel in AïnDraham, Tabarka: Dar Ismail
Sep24th (Tue)	08:45-18:30	Departure from Dar Ismail Hotel
	09:00-10:30	Visit to the Sylvo-Pastoral Institute of Tabarka
	10:30-12:30	Visit of the "Kroumirie mountains" ecosystem
Sep25th (Wen)	08:30-08:30	Departure from Hotel in AïnDraham, Tabarka: Dar Ismail
	09:30-11:00	Jendouba Regional Hospital
	11:00-13:00	Regional Department of Hygiene and Environment Protection of Jendouba
	14:00-16:00	The Department of Public Health in Jendouba.
	16:00-18:30	Departure to Tunis
Sep26th (Thu)	09:00-09.30	Visit to the Japanese Embassy in Tunisia
	09:30-11.30	Visit to SONEDE, Tunisian National Water Distribution Utility
	11:30-12.00	Visit to JICA office in Tunis
	12.30-14.30	Wrap-up meeting at hotel Le Belvédère
	18.25-22.00	Tunis Carthage Int. Airport (AF1285) - Paris airport.
Sep27th	23.45-18.30	Paris airport (AF278) -Narita Airport. Japan

1. 2 Location of place visited and route map

Location of place visited in Paris, France

Travel Route in Tunisia

1. 4 Visited Place and Contact Personnel

Date	Place visited	Contact personnel
Sep 20th (Fri)	UNESCO	Dr.SarantuyaaZandaryaa, Ms. SendaHtssoumi Programme Specialist, Division of Water Sciences
	Pasteur Institute	Pr. Jean-Louis Virelizier Professor emeritus at Institute Pasteur, Paris
Sep 22th (Sun)	INAT	Professor Jamila Tarhouni, INAT(Institut National Agronomique de Tunisie) Professor Dr. IssamNouiri, INAT Mr.Akihiko Yahata, coordinator of BUTUJ(Bureau de Universite de TSUKUBA pour les Universites Japonaises)
Sep 23th (Mon)	Ichkeul" ecosystem	Mr. Habib Ghazouani, Conservateur Park National Ichkeul, Ministry of Agriculture and water resources
	Fisheries Institute	Ms. BellokchalMouna, Mr. Mohamed Chalghaf Researcher of culture of microbiology
	Sidi El Barrak dam	Mr.Mokhfar General director of dam and hydraulic infrastructure.
Sep 24th (Tue)	Silvo-Pastoral	Mr. Abbas Chabâane Director of Silvo-Pastoral Institute of Tabarka
		Mr. Youssef Researcher of Silvo-Pastoral Institute of Tabarka
Sep 25th (Wen)	Hospital of Jendouba	Mr. MounirManai Director of the Jendouba Regional Hospital
		Mr. Touihri Noureddine Head of Jendouba Regional Department of Hygiene and Environment Protection
		Mr. D'BaliSoutieil Regional Director of the Jendouba Department of Public Health
Sep 26th (Thu)	Japanese Embassy	Mr.Toshiki Tanaka, Third Secretary Mr.Tamotsu Ikezaki, Minister Counsellor
	JICA-Tunisie	Mr.Taro Kikuchi, Director

Chapter 2: Detailed Reports

2.1.1 UNESCO

Wei YANG

Preface

The EDL program at the University of Tsukuba provided us with a precious opportunity to visit international organizations, to attend talks and to communicate with leaders and officers at UNESCO. We learnt about areas which the UNESCO-International Hydrological Programme(IHP) focuses on and the kind of work they do, but also about how to communicate with other people appropriately as environmental diplomatic leaders.

Reception

During the visit to UNESCO, we were given a warm reception by a consultant of UNESCO Mrs. Senda Htssoumi and Doctor Sarantuyaa Zandaryaa. It was a good opportunity for us to learn how to receive visitors. First, good manners are the basic requirement for receiving visitors. Secondly, prior preparation is the determinant. Last, it is necessary to consider the visitors' needs and what they care about, and to do ones best to give practical help.

Report of UNESCO-IHP

Doctor Sarantuyaa Zandaryaa who is in charge of the Urban Water Systems Section gave a report focusing on the role of UNESCO in solving water problems. Through this, we gained a good understanding of the composition of UNESCO's water family, the development of UNESCO-IHP, the themes and focal areas of UNESCO-IHP, some associated and cross cutting programmes, and implementation of UNESCO-IHP activities.

Fig.2.1.1Communication during reception Fig.2.1.2 Introduction report of UNESCO-IHP

The growing water crisis necessitates that people pay more attention and take appropriate measures, due to the ever-increasing demand for water linked with population growth, increasing floods and droughts, water pollution and so on. UNESCO is a good international organization to lead work on water problems. Water at UNESCO consists of IHP, World Water Assessment Programme(WWAP), UNESCO-Institute for Water Education(IHE), and the Network of UNESCO Water Centers and Chairs. Doctor Sarantuyaa Zandaryaa gave a brief introduction regarding the last three. According to her introduction, we know that WWAP coordinates the work of 28 UN-Water members and partners in the World Water Development Report, monitors freshwater issues in order to provide recommendations, develops case studies, enhances assessment capacity at a national level and informs the decision-making process. UNESCO-IHE is the largest international postgraduate water education facility in the world and is based in Delft, the Netherlands. The Institute confers fully accredited MSc degrees, and PhD degrees in collaboration with partners in the Netherlands [1]. The centers and chairs are divided into two categories: the first is UNESCO institutes for Water Education; the other is linked with UNESCO but hosted by local governments.

From the detailed introduction of UNESCO-IHP, we know that IHP was created in 1975 after the International Hydrological Decade, which is the only intergovernmental programme of the UN system devoted to water research, water resources management, and education and capacity building. The programme, tailored to Member States' needs, is implemented in six-year phases – allowing it to adapt to a rapidly changing world. The continuity and change of the IHP is shown as Fg.3.

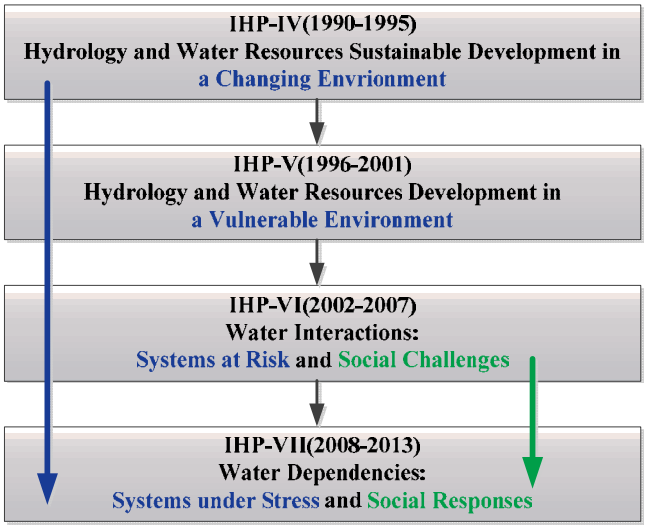

Fig.2.1.3 Continuity with Change of IHP

This year is the last year of IHP-VII, the next six year plan hasn't been made, so Doctor Sarantuyaa Zandaryaa introduced the current themes. Themes of UNESCO-IHP, and some associated and cross cutting programmes are shown in Fig.4.The achievement of sustainable water resources management can be achieved through promotion of research, knowledge transfer and education capacity building by focusing on the 5 themes.

Using some cases and some statistical data, Doctor Sarantuyaa Zandaryaa introduced some Associated IHP Programmes and Cross-cutting Programmes to us. The International Flood Initiative (IFI) uses the knowledge base and capacity for prediction, adaptation and migration of floods to reduce social, environmental and economic risks. The International Sediment Initiative develops appropriate methods and manages regional and local sediment problems based on international cooperation, promotes monitoring of sediment data and information exchange and provides advice to policy makers. Water and Development Information for Arid Lands(G-WADI) improves understanding of hydrological systems and water management needs in arid and semi-arid areas, and shares data and exchange of experience on a regional and global scale and strengthens global networks.

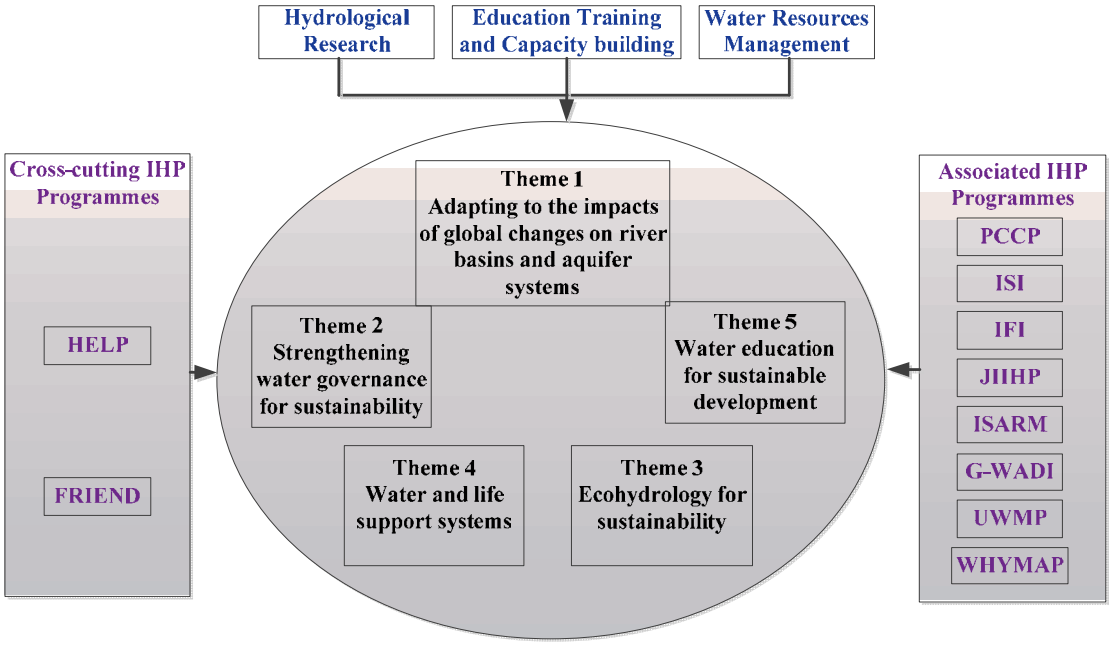

Fig.2.1.4 The relationship between the themes of IHP-VII, and crosscutting and associated programmes

P.S.FRIEND: Flow Regimes from International Experimental and Network Data; HELP: Hydrology for the Environment, Life and Policy; GRAPHIC: Groundwater Resources Assessment under the Pressures of Humanity and Climate Change; G-WADI: Global Network on Water and Development Information in Arid

Lands; IFI: International Flood Initiative; ISARM: Internationally Shared Aquifer Resources Management; ISI: International Sediment Initiative; JIIHP: Joint International Isotope Hydrology Programme; PCCP: From Potential Conflict to Cooperation Potential; UWMP: Urban Water Management Programme; WHYMAP: World Hydrogeological Map.[2]

The implementation of UNESCO-IHP activities should be action-oriented and policy-relevant. The objectives of activities are aimed at promotion of leading edge research that provides policy-relevant advice to Member States, facilitates education and capacity development as a response to growing needs linked to sustainable development, and enhances governance in water resources management to achieve ecosystem sustainability. Outcomes of IHP-VII should establish pathways and benchmarks for water management in the decades to come. They should contribute to sustaining human and environmental health wherever water-dependent systems are under pressure and effective societal responses are not yet in place [2].

After the introduction at UNESCO-IHP, we had the chance to ask some questions. We asked a wide range of questions based on our different research directions such as: salinization, sewage treatment, cooperation between developed countries and developing countries and so on. Some students paid close attention to the practical opportunities provided by UNESCO-IHP.

Fig.2.1.5 Asking question

Fig.2.1.6Introduction of structures and symbols

Guided tour of the UNESCO building

The sections of the UNESCO building, which represents science, education and culture, were introduced by a guide using scale models. We had the chance to see and to learn about the meaning of these symbols, sculptures and artistic works and the great cooperation among the members of UNESCO; peace, close relationships among people, making progress even when very difficult, and so on.

Epilogue

It is necessary for us to know about some environmental problems and look for some methods to solve these problems by visiting places that suffer from different environmental problems. It is also important to acquire some information and experience, to learn about technology and management systems through visiting some advanced international organizations. UNESCO-IHP provided us with different information and knowledge compared with previous internships.

Reference:

[1] UNESCO-IHP Water Dependencies: System under Stress and Social Responses 2008-2013, UNESCO-IHP June 2008.

[2] Water, http://www.unesco.org/new/en/natural-sciences/environment/water/ by IHP UNESCO, Date accessed Nov 16, 2013

2.1.2 Japan's Cooperation in Tunisia

Aleksejeve Jelena

1.1. Embassy of Japan

During our internship we had some minor changes in our schedule and some destinations had to be changed on the go. One of these changes was the visit to the Japanese Embassy in Tunisia. As this was an unplanned visit, it was very brief and we did not have the chance to ask many questions. Toshiki Tanaka, the Third Secretary, and Tamotsu Ikezaki, the Minister Counsellor of the Japanese Embassy in Tunis greeted us on our arrival. Due to the limited time available, the EDL internship participants had a chance to briefly introduce themselves and exchange a few words with the Minister Counsellor. After the introductions, during the short time allocated to the meeting, Mr. Ikezaki explained aspects of diplomatic postings and an outline of the mission of the embassy. He mentioned, that since the revolution in Tunisia in 2010 – 2011, the situation has become extremely difficult in the government and hence in other institutions related with politics. Revolution has brought changes in governing the country and embassies had to be careful with their support. During our internship visit, two years after the revolution, the situation was still unstable and sensitive. The Minister Counselor told us that the Japanese Embassy has taken the position of "a friend in need is a friend indeed" and it is supporting the Tunisian government in this difficult time of transition. Mr. Isezaki has also stressed that the Japanese government is eager to cooperate with the Tunisian government.

The Minister Counselor also mentioned that technological cooperation and transfer of technology is one form of support. The Japanese embassy provides assistance in the form of donations to local projects that contribute to human security. This is a part of a Japanese funding program providing support to non-profit organizations in developing countries that are working to improve living conditions. Organizations working for such causes can apply at the Japanese Embassy for this financial support. The target areas of this program are:

- Primary health care
- Primary education
- Public welfare
- Regional Development
- Environment
- Support for disadvantaged populations

- Basic infrastructure

The embassy also works as a promoter of Japanese culture in Tunisia. The webpage of the embassy, in March 2013, mentions the Japanese Embassy donated Kendo equipment to Tunisia in an attempt to promote Japanese traditional martial arts. As the Minister Counselor mentioned, importance is stressed on “bushido”, the “way of the warrior”, or mutual respect. Around the same time, Japanese Embassy organized a technical demonstration of Aikido.

We were also told that there are 5-6 Japanese restaurants in Tunisia. However, as it often happens in foreign countries, the food in Japanese restaurants is made from local ingredients and only remotely resembles the original cuisine.

1.2. JICA in Tunisia

The meeting at JICA was held in a very warm atmosphere and in the form of casual conversation. We listened to a small general presentation about JICA’s operations. It was stressed that the organization is finding opportunities to support the Tunisian government. We heard similar statements during our visit to the Japanese Embassy.

We were sad to find out that even though scholarships were available in the past, at present JICA does not have any scholarships for Tunisians to study in Japan. The reason is reorganization of the program and the organization as a whole. Due to pressure from the government JICA was forced to stop its scholarship program. In general the government still provides scholarships to developing countries, however JICA is not included.

After a brief introduction we spent the remaining time exchanging opinions and expressing our impressions of Tunisia and the internship overall. All of which will be included in the next chapter of our report.

2.1.3 Pasteur Institute

Nguyen Thi Tam

1. **Arrival at the Pasteur Institute and meeting with Professor Jean-Louis Virelizier - Professor emeritus at the Institute Pasteur, Paris**

He introduced the story of Louis Pasteur and the first vaccine when we stood in front of the monument of Pasteur and a dog. Louis Pasteur was born on December 27, 1822 and died on September 28, 1895. He was a French chemist and microbiologist. He was known as the father of microbiology. His famous innovation was to discover the rabies vaccine. A 9-year old was tested using this vaccine and it was successful. Pasteur was known as a hero and world medicine entered a new era. The first Pasteur Institute was established to facilitate research on vaccines.

Fig: 2.1.7 Professor Jean-Louis Virelizier beside monument of boy victim and the dog.

2. **Visited Pasteur museum and Pasteur's tomb**

The museum was opened in 1936, includes details of Louis Pasteur's life and work.

There was a stamp exhibition, which included a joint issue between France and Vietnam. The professor explained about Dr. Alexandre Émile Jean Yersin whose face appears on the stamps. Yersin was a Swiss and French physician and bacteriologist. He had a special love of Vietnam. He was a founding father of the town of Dalat, one city in Vietnam. He died on March 1, 1943 in NhaTrang, Vietnam. Nowadays, there are roads that are named after Yersin in Ha Noi, Da Nang, NhaTrang, Da Lat, Thu Dau Mot and Ho Chi Minh cities. Dr. Yersin is one member of the Vietnamese family.

Fig: 2.1.8 Professor Jean-Louis Virelizier with participants in the stamp exhibition

At the institute, there is Pasteur's tomb that was built in 1897 by his wife. There are lots of events written on the wall inside tomb. These events are related to Pasteur's scientific work and life

Fig: 2.1.9 The Pasteur's tomb

3. Campus visit of the Pasteur Institute

The professor explained about the research undertaken at the institute. There are three main activities at this Institute:

- Research in biology, especially microbiology
- Education
- Public health activities

2.1.4 APPEL association

Ding Jielu

1. The APPEL association

APPEL is a non-profit humanitarian organization supporting needy children in different countries of the world. It was established in 1968 and is based in France. The APPEL association operates in 13 countries of Asia, Africa, Latin America.[1] The main purpose of this organization is to help children and woman, who suffer from disease, natural disasters and wars.

The activities of APPEL association can be divided into three main parts, including public health, human rights, and environmental protection. In addition, APPEL also focuses on rural development in order to improve rural people's life.

Derailed list of APPEL association activities in recent years. [1]

- Improving hygiene in children hospitals and maternity homes
- Supporting street kids, handicapped kids and orphans
- Preventing AIDS expansion
- Improving water supply and sanitation
- Proving and upgrading medical help, including vaccination, obstetrics, emergency, orphanages, pharmaceutics.
- Supplying medical equipment.
- Rural development.
- Psychological help for victims of armed conflicts and violence.
- Preventing sexual exploitation of street and handicapped children
- Education

[1] Association L'APPE by Answeres™, http://www.answers.com/topic/association-l-appel

2. The meeting at the APPEL association

On 24 Sept, we were very glad to be invited to the APPEL association to have a discussion with a local NGO, the topic mainly focused on water quality and the environmental problems.

First, we talked about water quality problems, through several days living in Tunisia, we saw the piped water color or smell in Tunisia was not good, and this water could not be drunk directly. In the supermarket, we saw most families' chose to buy bottled water to satisfy daily water needs.

Fig: 2.1.10 The NGO of APPEL

Actually, the water quality in a natural setting in Tunisia is very good, because the main industry of Tunisia is tourism. So there is not so much waste water from agriculture and industry.

Most Tunisian famers use traditional agricultural methods that do not use chemical fertilizers. As we know, agricultural waste water is not easily dealt with and contains high organic compounds. If these were discharged into rivers, it will lead to the outbreak of blue-green algae, or red tide. Although Tunisia has manufacturing and processing industries, the number of factories is limited, and scattered throughout different regions. So the influence on water quality is not so obvious.

There are various reasons why water quality has declined. The first reason is the pipe and water transport system. Some pipes in use in Tunisia is old and this kind of pipe easily accumulates pollutants inside which leads to s decline in piped water quality. The second reason is pipe maintenance is not undertaken which leads to water overflow from broken pipes, so water loss in Tunisia is also high. The third reason is the sewer system, most rural areas are not connected to the sewer system, so the waste water discharges directly into the river. However the amount of sewage in cities is higher than in rural areas and most domestic sewage also flows into river without any treatment. Now the population density in cities is not so high so water pollution is not a serious problem but considering possible increases in GDP and population in the future, the construction of a sewage water system, especially in the city is necessary.

2.2.1 Water supply in Paris

Nurymkhan Marjangul

Eau De Paris (Paris Water Authority)

I will report on Paris Water Authority and Pavilion de l'Eau Museum of Paris and related water issues and management.

Nowadays, the world faces drinking water issues due to shortage and efficient solutions are required and how countries are concerned and deal with various water issues and comparison of their policies and regulations on water is important. From my involvement in the international internship trip held by EDL, I have increased my knowledge of water policy and regulation in France and Tunisia.

The trip commenced with the visit to the Eau De Paris (Paris Water Authority), the public body that is part of the municipality of Paris. It was amazing to know the inspiring story of how the public sector benefitted from re-municipalizing the water supply and the detailed information on water consumption rate and level for residents in Paris. From my understanding, water supply had been through either public or private sector companies and since 2010 Eau De Paris took over as the single authority for the water service. Regarding the sewage system, the Ministry of Health was in charge of hygiene and sanitation, quality control and enforcement until 2009 while production transportation pressure quality was managed by Eau De Paris and Veolia, and Suez utility companies provided delivery service to consumers.

The significant benefit of transformation into a public body is the full authority to oversee billing for the water service. Eau De Paris provides a water service only to residents of Paris city. The population of Paris is 2.1 million, the aqueducts stretch 430km and drinking water storage has a capacity of 1.1 million m3. The daily water consumption per person is 120 l while the overall daily consumption in Paris equals one and a half of the volume of the Eiffel Tower or 450 thousand/m3. The water rate is 3.11euro/l in Paris and it increases to 4.11 euro/l outside the city.

The Paris water price means when people pay for drinking water, they pay the cost for treatment of water used. In other words, Parisians receive a single inclusive bill for payment. Compared to other European countries, Paris has the most innovative water treatment technology. The residents are frequently informed about water quality through promotional materials, thus they largely tend to prefer bottled water to tap water. Generally, the direct use of tap water is 100-300 times cheaper than plastic bottled water.

After the visit to the Paris Water Authority and witnessing their activities, I had the feeling that the residents in Paris do not have any anxiety over their drinking water supply and quality. Moreover, the re-municipalization has provided efficient management for drinking water supply and delivery issues. However, from my comparison with other sources, I consider it efficient management in a limited way.

Pavilion de l'Eau

The trip continued to the Pavillon de l'Eau with the assistance of a guide. The name of Pavillon de l'Eau is translated into English as the Water Pavilion and is under the authority of the Paris Water Authority. As a result of the visit, we learnt how the sewage system was established and developed in Paris and later advancements and milestones as well. The museum not only explains the sewage system of Paris to foreign travelers, but also provides educational programs for school children which I felt were really effective.

Fig: 2.2.1 Layout of Paris water distribution

The mapping on the floor of the museum amazed me with its colorful demonstration of the history of Paris aqueducts and the water cycle system. Out of 6 aqueducts, only one has fallen out of use, the rest all operate well.

Fig: 2.2.2 Water distribution in ancient time

Moreover, the posters present a detailed picture-history on the museum establishment, milestones and operation of the aqueducts. The initial development of an aqueduct was as a room where the quality of the water could be determined through observation.

It was interesting to know from the museum guide that the quality of water was only determined through observation. This observation was conducted by single sewerage worker who walked 25 km daily to inspect each aqueduct therefore the water quality was overseen by a family from generation to generation.

To sum up, the trips arranged by the EDL office were beneficial for students to advance their knowledge on environmental issues in different countries. These opportunities enabled them to get acquainted with issues on site and extend their knowledge.

2.2.2 SONEDE and water distribution in Tunisia.

Aleksejeve Jelena

On the last day of our internship we visited SONEDE, the Tunisian National Water Distribution Utility. It was founded in 1968 and belongs to the Ministry of Agriculture. It is responsible for providing water to the nation. According to the presentation given to us, there are two institutions that provide water in Tunisia, rural and SONEDE, with the latter supplying 80% of population. Even though the drinking water sources, their availability and demand vary depending on the region, SONEDE is expanding its services to more consumers both in urban and rural areas. With personnel of roughly 8000 people, it keeps expanding its services.

Statistics:

Indicators	1968	1990	2000	2010	2011	2012
Number of subscribers	103000	937676	1548085	2304242	2386318	2461995
Volume of water distributed (in Mm ³)	82.0	256.1	331.5	478.8	494.7	532.0
Overall network performance (in%)	70.0	70.4	81.4	76.2	74.7	74.4%
National coverage rate (in%)	31.0	75.4	78.4	97.8	97.9	97.8
Connection rate in urban areas (in%)	44.0	85.1	93.0	99.3	99.3	99.4
Connection rate in rural areas (in%)	2.0	18.2	35.7	44.4	45	45.5
Number of treatment plants	02	08	10	14	14	16
Number of desalination plants	00	01	04	04	04	05
Number of samples of water for sanitary control (samples)	-	31631	51278	47569	49150	48251

Source: SONEDE

According to the information provided and information from the official webpage, SONEDE's activities are as follows:

- Designing and constructing facilities for water collection
- Treatment and production of drinking water
- Technical management of networks
- Commercial management of subscribers

According to the presentation, the main problem that SONEDE is dealing with is water shortage and the challenge of supplying enough good quality water. In order to improve the

amount of drinkable water, the institution is turning to desalination. As it is an expensive and technologically demanding endeavor SONEDE is collaborating with Japan, which is financing 2 out of 5 existing desalination plants in Tunisia. As an example of technology transfer, these two plants are operating on solar energy and are a present from the Japanese government. At the time of our visit, we were told that in a week's time, SONEDE would be receiving a committee from Japan, which will install a desalination plant, with a production capacity of 200,000 m3.

The first desalination plant in Tunisia was built in 1983 with the second one constructed in 1995. With the introduction of these plants, the water supply to the surrounding areas and its quality was successfully improved. The project followed with two more desalination plants in the cities of Djerba and Zarzis with a capacity of 12,000 m3/d. With every new desalination plant, the quality of water has been successfully improved, from a salinity of 2.7g/l to 1.5g/l. Currently this system provides for 4%of total water supply.

Accessible (A) and available (B) water in Tunisia (Mm3/y) at different time.

	1996		2010		2020	
	A	B	A	B	A	B
Large dams	1 340	871	1800	1170	1750	1138
Hillside dams and lakes	65	59	100	50	70	35
Tube wells and springs	997	997	1250	1150	1250	1000
Open wells	720	720	720	720	720	620
Reclaimed water	120	120	200	200	290	290
Desalinated water	7	7	10	10	24	24
Total	3249	2774	4080	3300	4104	3107

Source: Bahri, 2002

The second part of the presentation focused on the challenges faced by SONEDE. Main challenges are as follows:

- Connection of networks
- Network performance
- Increasing the supply capacity
- Increasing raw supply
- Water quality

Connection of the network seems to be a real challenge, as SONEDE has to stretch its pipelines from the water plants to all areas of Tunisia. This is complicated due to Tunisian geography as the

country stretches from North to East with majority of plants located in the Northern part of the country. Closer to the Sahara region water scarcity is a big and persisting problem.

According to the presentation, SONEDE has to deal with the issue of network performance in relation to water distribution. Current network performance is at 74.4%, the rest is being lost during transportation.

In some areas network performance is increasing e.g. up to 90%. However some areas of the country have very old systems. Another interesting fact that was mentioned in regard to network performance is that the counters might be unreliable as there might not be enough pressure in the pipe for adequate performance of the counters. The efficiency level seems to be lower in recent years and to counter the possible effects from insufficient pressure in the pipes, SONEDE is allocating its resources to improving and renovating the piping system, which will decrease the leakage rate.

Strong emphasis is placed on increasing the water supply through strengthening the infrastructure, constructing storage tanks and decreasing the amount of water lost in transportation. SONEDE is also trying to increase the capacity of water treatment and extension of distribution networks.

Tunisia is facing water shortage problems, with water availability of roughly 480 m3 per capita. In comparison, the average water availability in the Middle East and North African countries is 1200 m3 per capita. (Source: WHO) Ground water and surface waters are the main source of raw water supply. The country has potential to remedy its water shortage problems through desalination technology, however financial support is required as such technology is costly. SONEDE is also increasing dams, creating bigger raw water capacity dams such astheSidi el Barrak dam that we have visited during our internship. However the dam reservoirs have a sedimentation problem that over time decreases storage capacity.

It is estimated that water demand will continue rising along with the increase in population which will lead to further urbanization and expansion of agriculture which will stretch the water supply even more. (Bahri, 2002) All the above mentioned reasons will lead to more water pollution increasing the need for water purification capacity and stringent water control.

Water use at present:

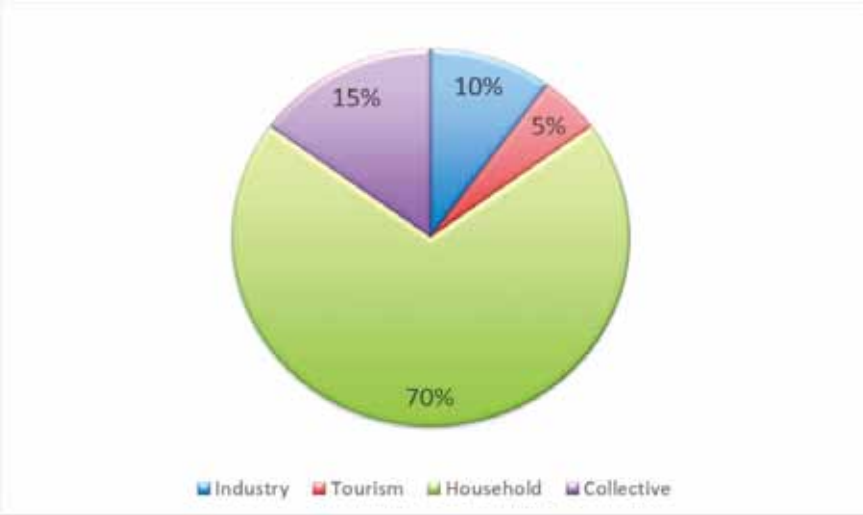

Fig: 2.2.3 Water use

Source: SONEDE

In order to ensure the sustainability of water resources in the country, SONEDE implements strategies of preserving water resources. It promotes a water saving approach and sustainable development through raising the awareness of Tunisian people.

In general water quality in Tunisia is good. However the quality varies depending on the region. Tap water in Tunisia is of good quality and is drinkable without further processing. SONEDE is in the process of acquiring ISO certification for all regions of the country, however at present there are 13 districts with ISO9001 certification. (Source: SONEDE)

Overall our visit SONEDE was very informative and we were able to learn in detail the many aspects of Tunisia's water supply system and its existing challenges.

Fig: 2.2.4 Activities of SONEDE in presentation

2.3.1 The Ecosystem of Lake Ichkeul, Tunisia.

Miah MdTofail

We visited Ichkeul National Park, Tunisia on September 23, 2013. Mr. Habib Ghazouani, Conservateur Park National Ichkeul, Ministry of Agriculture and water resources was our guide during the visit.

Fig: 2.3.1 Ichkeul National Park

In Bizrte, Tunis the humid coastal area of Lake Ichkeul's ecosystem is very famous for flora and fauna due to the area consisting of the lake, hills and marsh land. The lake is considered one of the major wetlands in the western Mediterranean basin. The annual rainfall is more than 600mm and average temperature between 7°C to 18°C. Lake Ichkeul acts like a reservoir that collects all the mountain and river water from the east and finally excess water flows to the sea through a 5 km channel.

Fig.2.3.2 Lake Ichkeul

Fig.2.3.3 Marsh land


Fig.2.3.4 Forest and mountains of Ichkeul Ecosystem

The lake provides plenty of food for ducks, strokes, flamingo's etc. It has exquisite reed beds and scrubland, which provides habitat for lake creatures including 200,000 migratory birds. From the viewpoint of biodiversity it has almost 530 species; 22 Mammalian species, 180 species of bird, 19 reptile, 24 species of fish and 20 species of eagle. In 1980 this National Park was declared a Ramsar site on the UNESCO world heritage list.

In Roman times the Ichkeul area comprised about 30,000 hectares. Now it is reduced to 8,500 hectares. The area of marsh land is 2740 hectares and forest and mountains area is 1,365 hectares. The lake, mountains and part of the marshland belong to the Government and people own the rest of the marshland. Water from Lake Ichkeul is used for agricultural irrigation via a channel system.

Administration and environmental management including planning and maintenance of Ichkeul National Park is overseen by different government agencies. The Regional Commission for Agriculture Development under the Ministry of Agriculture is now responsible for the management of the park. The Department of Forests is doing monitoring work in the area.

Lake Ichkeul has a capacity of 3.5 million cubic metres of water per year however it receives all most five times that due to the inflow from six rivers. This is why the idea of dam construction was introduced to reserve some excess water for irrigation purposes and also to meet the water demand of city dwellers. It was considered that the Ichkeul ecosystem would not be comprised by these plans. However after the dam construction in 1996a lot of problems occurred in north-west Tunisia and water runoff reduced from30000 cum to 2000 cum. Birds and fish including aquatic species were affected significantly due to insufficient run off and the numbers of birds decreased drastically from 200,000 to 30,000.

The Ramsar committee visited Ichkeul Park in 1996 and observed that fresh water inflow had reduced, salinity increased and the number of birds had declined drastically. The committee declared Ichkeul a World heritage site in danger and asked the Tunisian Government to initiate some remedial measures to recover the environmental degradation. In 2000 a joint mission conducted by IUCN- The World Conservation Union, Ramsar Convention on wetlands and World Heritage Convention provided support with some recommendation to overcome problems and aid restoration.

The Tinja canal connecting Lake Bizerte and Lake Ichkeul and Tinja sluice gate was constructed in 1980 to control the water flow. The sluice gate started its operation in 1996 based on ANPE. At the end of the 19th century the French connected Lake Bizerte with the Mediterranean Sea so as to reach Menzel Bourgiba more quickly. This channel allows the entry of Mediterranean sea water into Bizerte lake.

Fig.2.3.5 Connection between two lake through Tinja Canal

Ichkeul's ecosystem has in some way recovered its former state by multi-disciplinary activities and planning. When water shortages occur in Ichkeul, lagoon water supplied from the Sidi al Barak reservoir or water is allowed to come from Bizerte Lake through the sluice gate. However the intrusions of sea water increase the salt concentration in the lake due to evaporation. During October-March more fresh water including rainwater enters the lake and dilutes the salt concentration and finally move to the sea. Hence the salt concentration is balanced by allowing fresh water to come and drains the mixed water into the sea. When the water level inside the lake drops sea water is allowed to enter again. This is how they manage water quantity and balance salinity in the Lake Ichkeul.

As a part of a number of multidisciplinary initiatives taken by the Tunisian Government within couple of years the number of fish and birds increased dramatically. Fish are allowed to

migrate between the two lakes. Salinity levels have also reduced significantly. Finally in 2006Lake Ichkeul was deleted UNESCO's list of world heritage in danger.

Now there is a committee of Ichkeul National Park formed by local residents, the agricultural development group of that area, different stakeholders and government departments. All aspects of the lake and its ecosystem are under constant surveillance including monitoring of P^H, salinity, dissolved oxygen etc. of lake water.

The committee also works on sustainable tourism for income generation and conservation of this wetland by increasing awareness and providing basic training to local people for promoting and expanding tourism activities. Lake Ichkeul authorities provide guides for excursions, museum visits, nature travel, mountain hiking and bird watching for visitors. Tourists enjoy natural hot springs near the lake through use of traditional hammams. Arranging open days of agricultural products for visitors has emphasized the importance and coexistence of tourism and local agriculture The number of domestic and foreign visitors has increased since 2006 when the ecosystem was restored.

Now salt concentration is increasing due to repeated evaporation. In future the amount of salt will be greater than the Mediterranean Sea if not controlled properly. Between 1992 and 2002 there were two prolonged droughts that created a hydrological imbalance in the area. This is why the habitats of the Lake Ichkeul area decreased dramatically.

Many domestic and international students undertake research here in order to understand the management and transfer of different social, economic and environmental values at this site. Much international cooperation is ongoing in this area. The museum plays a key role for visitors to understand the past and present of the Lake Ichkeul ecosystem and its biodiversity.

Fig.2.3.6 Ichkeul National Park Museum

Lake Ichkeul's ecosystem has been restored through Government initiatives and multidisciplinary activities. It is an example for the development of alternative solutions to mediate environmental degradation.

References:

Ramsar Advisory Missions: Report No. 41, Ichkeul, Tunisia (2000) available at http://www.ramsar.org/cda/en/ramsar-documents-rams-advisory-missions, accessed on November 23, 2013.

A Ramsar case study on Tourism and wetlands, 11th conference of parties, July 2012, available at www.ramsar.org/tourism, accessed on November 23, 2013.

2.3.2 The Silvo-Pastoral Institute in Tabarka

Ding Dahu

After a good night in a five-star hotel, we arrived at the Silvo-Pastoral Institute in Tabarka. It was another beautiful day in Tunisia. This institute was established in 1970 and services not only Tabarka, but also a wider area. According to the logo represented on the door of this institute, we know that it participates in the TEMPUS program. Tempus is the European Union's programme that supports the modernization of higher education in Partner Countries of Eastern Europe, Central Asia, the Western Balkans and the Mediterranean region, mainly through university cooperation projects [1].

Fig: 2.3.7 The Silvo-Pastoral Institute in Tabarka.

After our arrival, we were led to a meeting room. There we met the director of this institute, Mr. Abbas Chabâane, who expressed his warm welcome to us. A teacher of this institute, Mr. Youssef, gave us a brief introduction to the institute.

Fig: 2.3.8 Mr. Youssef is giving us an introduction to the institute.

Through his introduction, I found out that the institute currently has two sections: deforestation and ecological environment, and from 2014, a new section will be added. He also talked about what they are doing now for government and local residents. For example, there are many kinds of mushrooms distributed in the forest area in Tabarka. Most local residents are not sure which kind is toxic and which is nontoxic. The institute can provide guidelines to government and local residents, teaching them how to distinguish between the different fungi. In addition, he mentioned that use of chemical products brought negative effects to the natural system. They are trying to teach people to use them in the correct way. In the high humidity forest area, Mr. Youssef mentioned that health is the main problem. On the other hand, there are also many natural resources that could be used as medicine from the forest. There are 2230 kinds of plants in the area.

When talking about the effect of global warming on the biodiversity of Tunisia, Mr. Youssef said different areas had different species of plants and global warming should have some negative effects but it was difficult to check. Regarding medicinal plants, people usually have no idea which kind of medicinal plants can be used for special diseases. Mr. Youssef indicated the institute could give guidelines to government and local residents based on research outcomes. Ecotourism was not a problem because they could cooperate with hotels, and there are many medicinal plants that could be sold. Some student's asked about forest fires in this area and Mr. Youssef answered that each May-September was a dangerous time for forest fires in Tunisia. Since 1998forested areas throughout Tunisia have increased mainly due to human activity. He also explained that with the development of civilization, people in the forested areas moved to the urban areas and the area they migrated from was replaced with forest.

After the lecture by Mr. Youssef, we visited a laboratory at the institute. There, we met Sarah, a lecturer who told us the laboratory is mainly used to conduct the soil analysis. She mentioned that the pH of soil in forested areas is about 6 and in field area is about 7.

Fig: 2.3.9 Professor Jamila collecting a piece of bark for us (left) and a wine cork factory using bark for raw material (right).

After visiting the Silvo-Pastoral Institute in Tabarka, Mr. Youssef showed us the forest system in Tabarka. A very interesting phenomenon was observed;much barkfrom the trees had been removed, as shown in Figure 1.3. Mr. Youssef explained that from June to July, local workers collect bark to make wine corks. 20-25 year old trees are useful and the removed bark needs9 years to regenerate. The life of this kind of tree is about 150-300 years.

Fig: 2.3.10 Mr. Youssef is introducing a kind of plant from which oil can be extracted.

Mr. Youssef also showed us a plant, from which oil could be extracted. The type and amount of oil varies between leaves (essential oil) and fruits (fixed oil). More interesting, the oil type and amount for the male and female of this plant is also different: 2-3L/ton for female one and less than 1L/ton for male ones.

References:

[1] The Education, Audiovisual and Culture Executive Agency (EACEA) of European Commission, http://eacea.ec.europa.eu/tempus/.

2.3.3 Function of the Sidi El Barrak dam in Tunisia

Erdenebadrakh Munkhjargal

We arrived at the Sidi El Barrak dam and met Mr. Mokhfar, general director of the dam and hydraulic infrastructure that belongs to the Ministry of Agriculture and Hydrolytic Resources. He explained that the dam is located in the north east of Tunisia where 80% of the water resources are concentrated. It collects water from four rivers. An earth-fill dam "Sidi El Barrak" is situated in the west of Tunis, about 1.000 m from Mediterranean coast. On left side of the river bed, the dam was founded on sand, and on the right side on rock. The lowest foundation level in the dissipation basin is 14.5 m below sea level, and the level of underground water is between 1.5 - 2 m above sea level.

Objectives of constructing this dam were:

Supply of 180m^3 per year for drinking water and transfers to urban towns via pipe line.

To provide permanent irrigation for over 8000ha of new farming plots in the project agriculture area.

To improve the water quality in the north of Tunisia; the salinity of dam is 0.3- 0.5 gram/per litter. It means very high quality.

To regulate water the level of the Ichkeul" ecosystem

Fig: 2.3.11 The Sidi Al Barak Dam and Reservoir

Sidi El Barrak dam was builtbetween1994-1999 and was brought into use in 2001. Total capacity of the dam is 286 million m3. Its total area is 4000ha. A dam-reservoir of a total capacity of 264 million m3 was also constructed. It is second largest reservoir in Tunisia. The total construction cost was around 235million diners (120 million euro) which was supported by the World Bank.

The purpose of the Sidi El Barak Development Project was to construct a dam in order to improve water flow and transfer structures making it possible to pump water from the dam and contribute to the ecological balance of Lake Ichkeul, provide permanent irrigation to over 5,500ha of new farming plots in the project area and supplementary irrigation over 9,500 ha in the Cap Bon region.

Finally, through this EDL internship we were able to experience water issues and culture of two different countries.

2.3.4 Production of the oak wine corks

Ding Jielu

After the meeting with the APPEL association, we visited a wine cork manufacturer in Tunisia, This factory produces many wine corks for sale overseas. As photographs were forbidden inside the factory I will explain the production process below.

The production process is divided into two parts; one is piking the oak, the second is production. In Tunisia, many mountains are covered with oak and when these trees are25 years old, the bark will be stripped for wine cork production. Each cycle takes 9 years from bark growth to stripping and each tree completes around 16harvesting cycles during its lifetime.

Fig: 2.3.12 The oak tree after stripping

Fig: 2.3.13 The recover of the oak tree bark

The advantage of oak

- The internal structure is cellular, full with air. So the elasticity of oak is very good.
- High wear resistance
- Moisture-proof and anti moth function under dark damp cellar conditions
- Natural material, less damage to human health

The second process is manufacture, after entering the gate of the factory, we can see much oak bark accumulated in the open space. This is the first step in wine cork production, Tunisia is very dry, so outside drying evaporates the moisture inside the oak bark. The drying time will take nearly one year.

The oak bark is moved into the factory for the second step, compression. The oak bark is put into equipment where the oak bark will be compressed under temperatures between 120°C and 230°C and at a pressure between 2×105 Pa and 30×105 Pa for nearly 5 minutes.

Fig: 2.3.14 The product after screening

The third step is to produce the wine corks; this process makes holes in the bark and produces a rough shape. Broken corks are screened out at this stage.

The forth step is to produce the oak corks according to specifications and bleaching. Through this step the corks are made the same size through compression. Finally, the finished products will be printed with different kinds of trademark and sold to wine makers. In order to reduce the number of defective corks the products of each stage are screened through to the next.

The advantage of oak corks for wine

- The state of oak corks is stable, and can improve the color of wine
- The oak corks can promote the volatilization of polyphenols and aroma substances.
- The oak corks also have the function to soften the wine, and improve its texture.

Fig: 2.3.15 The oak in different process

2.4.1 Aquaculture at the High Institute of Fisheries, in Tunisia

Erdenebadrakh Munkhjargal

On 23 September, our EDL group visited the High Institute of Fisheries and Aquaculture in Bizerte and had lunch. After lunch we walked around and had an introduction to the institute. The institute's objective is the teaching of fishing and Aquaculture, technical support and the improvement of research activity and higher education under the ministries of Agriculture and Hydraulic Resources and Scientific Research and Technology. We visited a laboratory for the biological analysis of marine species. There Miss Bellokchal Mouna introduced her own research work and laboratory activity. She studied in Korea for several months and is trying to build a culture collection of Microalgae species. Many types of projects are being undertaken at the institute. Next we met Mr. Mohamed Chalghaf. Under the auspices of KOICA they have built a small scale basin for cultivating oysters which. In this institute microalgae, have been cultivated as food for the cultured aquatic oysters.

Small oyster are imported from France, reared and reproduced and then sent to the commercial market. Now they are working on improving technology. This project has been carried out successfully since 2008.

Fig: 2.4.1 Oyster cultivation

2.5.1 Hospital Hygiene and Environment Protection in Jendouba, Tunisia

Bui ThiTuyet Van

Places: The Jendouba Regional Hospital

The regional Department of Hygiene and Environment Protection in Jendouba

The Department of Public Health in Jendouba.

Date: 25th September 2013.

This report is based on information provided by:

- Mr. Mounir Manai

Director ofJendouba Regional Hospital.

- Mr. Touihri Noureddine

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The regional hospital of Jendouba city is one of thirty-three regional hospitals in Tunisia. The total labor force to 31st December 2012 is 851 people, in detail:

	Number	**%**
Medical staff	98	12
Paramedical staff	524	62
Technical staff	10	1
Administrative staff	26	3
Workers	193	23
Total	*851*	

Technical scanner use increased from 4823 to 5721, and 6066 in the year 2010, 2011 and 2012. Especially, this hospital uses *Chirurgle-Viscerale* for canner treatment. The following data demonstrates the evolution of activities at emergency and external consultation:

	Urgent service		
Year	**2010**	**2011**	**2012**
Urgency	94408	108182	124000
External consultation	93197	105624	106819

Fig:2.5.1 Group photo visiting the regional hospital in Jendouba

Noticeably, there is coordination between the regional hospital and the regional department of Hygiene and Environment Protection in Jendouba, a large city located in northwestern Tunisia. Hygiene activities have four essential objectives. First, they want to control water including groundwater, seawater, waste water and dam water, and microbiology. Some surveys were implemented for the assessment of pollution in aquifers. The main economic activity in this area is agriculture, and during the production process, local people use a lot of chemicals, so it is necessary to monitor and evaluate waste water and microbiology. With urban waste water, there are some treatment plants near the river and the cleaned waste water is discharged directly into the river. In the treatment plants, waste water is treated by two processes; physical treatment and biological treatment, and occasionally ozone treatment. A second objective is to control food products focusing on bacterial aspects such as toxin in the meat, and dried food. In addition, they also control the change of food industry and food quality. A third one is to concentrate on health and the environment, especially environmental pollution and insects. They research relationship

between insect and disease because insects are responsible for the appearance of some diseases. For example, in the year 2012, a big flood occurred in Jendouba. To prevent water-born diseases, this department undertook a project to look for and avoid bacteria that can cause diseases after disaster, cleaned and renovated houses. The final one is the controlling of solid waste. In detail, they want to control the relationship between carbon and ozone, especially where construction is undertaken.

Due to problems of hospital hygiene, surveys are carried out to assess the kind of insects related to diseases and also how to control the amount of waste from hospital and food and water in the hospital. There are special laboratories to research these issues. Moreover, they research global warming and try to find the relationship between global warming and diseases, and assess global warming from green house gases, and how to reduce ozone depletion. They also organize environmental education programs.

When visiting the department of Public Health in Jendouba, general information about health is provided. Tunisia is divided into 24 governorates. Jendouba city is the capital of Jendouba Governorate. In Jendouba Governorate, there are two regional hospitals, 114 primary health centers (80% of centers serve the rural population), 5 local hospitals, and 3 clinics. This department focuses on two matters such as basic medical care and the environment; and it is in charge of medical staff training and management of health facilities provided by the government.

2.5.2 Risk Management of Farmers against LCZ in Tunisia.

Miah MdTofail

We attended a seminar at INAT (Institut National Agronomique de Tunisie) on September 22, 2013. Professor Dr. Issam Nouiri presented his research on irrigation practices and reduction of risk for farmer exposure to LCZ (Leishmaniasis Cutaneous Zoonotic).

Leishmaniasis Cutaneous Zoonotic is considered a serious public health issues in different parts of Tunisia. About 30 persons per 0.1 million people are affected annually. From an epidemiological point of view the number of cases is very high. In 2004 almost 50,000 people were affected by LCZ. Hence control of this disease is inevitable. Leishmaniasis is transmitted to humans by the vector *P.Papatasi* and causes severe skin sores and women are more vulnerable. The parasite lives on *Meriones Shawi* and hindering the vector will be one good solution to reduce the risk of people contracting LCZ.

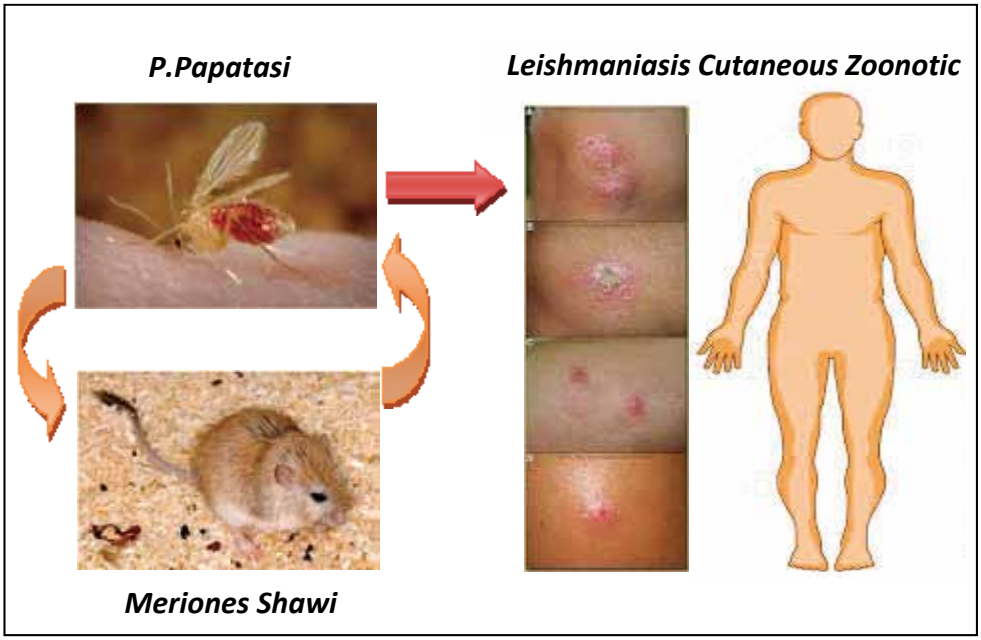


Fig:2.5.2 Transmission Cycle

In different areas in Tunisia farmers are vulnerable to LCZ since they live in the same location as the vectors due to agricultural work. Agricultural activities provide favorable moisture conditions for the mosquito. With 5 years for one climate cycle if crop production is increased then the number of animals will increase. As a result farmer's risk for leichmaniose goes up. Later farmers are unable to produce more crops and consequently vectors are reduced in numbers.

In his research Professor Nouiri aimed to control optimal irrigation management and improve the relationship between farmers and water resources. He also emphasized moisture management, which is strongly connected with the vector population. He gave an overview of his case study. The

main project is located in the Sidi-Bouzid area and the study areas are i) El Hichna,ii) Oued Mhammed and iii) GaraatNgia. The purpose of his case study is to provide a reasonable solution among the residents to reduce risk for LCZ.

Ground water is supplied to 163 hectares of land owned by 280 farmers at Sidi Sayah-I in El Hichnavia channels and flood irrigation. There is a limit to the source of water supply. The farmers have to spend more time on irrigation. Most of the farmers work at night and are more risk of contracting LCZ. The reason is that the adjacent areas of the water channels provide suitable moisture for the vectors.

He approached GDA members and asked to set up the irrigation water supply time, frequency and technique in Oued Mhammed. There are 60 farmers with an area of 76 hectares which is comparatively small. Their irrigation technique is quite advanced. They use pipes from ground water storage to the field and then sprinklers in the field. Hence, the farmers are less exposed to the risk of LCZ since less moisture is available during irrigation. The GDA manage irrigation supply hours based on the farmers' request. Farmers work for a limited time when water is provided. In July, 2009 during high season the farmers worked from midnight to morning and the total risk measured 28.6. In the next month of August, 2009 the risk reduced to 16.68 since the irrigation hours and water demand reduced from the previous month. In the same way in January, 2010 the risk reduced to zero since farmers work occasionally during the day.

Still there is a real exposure risk to LCZ in Sayah-I in El Hichna due to irrigation activities where in the Oued Mhammed area there is no exposure risk since irrigation activities changed to lessen the vector population significantly.

This is an example of dealings with the risks from water source and irrigation. We have to manage our water for optimum irrigation use and not allow favorable climate conditions for vector development. In this way we can reduce the risk of farmers for exposure to LCZ by cutting the chain of parasite transmission cycle.

References:

"Analysis of the irrigation practice and its impact on farmers exposure to LCZ"; A seminar by Dr. IssamNouiri at INAT on September 22, 2013.

"Cutaneous leishmaniasis in Tunisia", available at http://www.emro.who.int/neglected-tropical-diseases/countries/cl-tunisia.html, accessed on November 23, 2013.

Chapter 3: Individuals Internship Appraisals

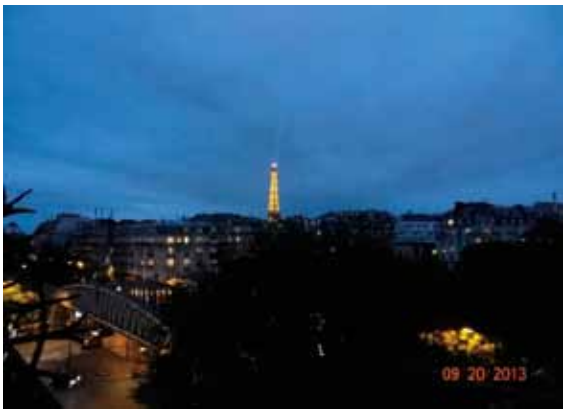
3.1 Memories of experiences in France and Tunisia

Nurymkhan Marjangul

The International internship from France to Tunisia was the first international trip as a group. I would like to give my impressions of the trip and the knowledge and information acquired.

First of all, I want to express my gratitude to the EDL program for their kind consideration in providing such a wonderful opportunity to be involved in the trip. Moreover, my appreciation largely extends to Prof. Naomi Wakasugi and Takeuchi san who made tremendous efforts for logistics, planning and arrangement issues of the trip from beginning to the end.

From the first day I was impressed with everything including the city planning, architecture, transportation, people etc., probably due to this being my first ever trip to Europe.



The trip commenced with a visit to the Headquarters of UNESCO, located on the Place de Fontenoy, in Paris. The meeting with Dr. Sarantuyaa Zandaryaa, a Programme Specialist, Division of Water Science, UNESCO was remarkable as firstly, I felt proud of her employment in such a highly reputable organization and secondly, her capacity and experience to present the issues she has been in charge of, in terms of research field and the works/projects implemented. Throughout her lecture, I learnt about methodologies applied to hydrological studies and to training and education in water sciences conducted by UNESCO and how efficiently its regulations and management are coordinated amongst scientists and policy makers through cooperation and recommendations. As for the majority of developing countries, there is a big gap between policy makers and scientists and even in some cases researchers feel reluctant to share their research results with policy developers. From the visit to Eau De Paris it was fascinating to learn the history of water issues in Paris and I will provide more details in my other section of the report.

The visit to the Pasteur Institution was another wonderful opportunity for me as a researcher in microbiology. As a curious researcher, the history and the research fields of the institute raised my interest as it is considered to be a symbol of science and French culture, the institute has been contributing to the prevention and treatment of infectious diseases through research, teaching and public health initiatives for 120 years.

Further the trip continued to Tunisia and again my expression of gratitude is extended to Prof. Akihiko Yahata, Prof. Jamila Tarhouni and Dr.Anis Chekirbane for the wonderful arrangement of our trip from the pickup service to their companionship throughout the trip. All the institutions included in our itinerary provided a good description of their efforts and activities and most importantly their challenges that are similar to the issues being tackled by developing countries. Due to socio-economic capacity failures, they have been challenged to undertake research. However, it was observed that Tunisia is much concerned with water issues as the country is situated on the Mediterranean coast of North Africa and drinking water shortage issues have been priority. What was the most impressive is that under the framework of JICE project, the sea water is treated to be used as drinking water. The itinerary originally did not include the visit to the cork factory; however it was amazing to get to know the whole process. From the production process, I felt that there should be more concern about preserving the trees. In addition, prior to my trip to Tunisia I had made a presentation on health issues in Tunisia and I have seen much disparity between the facts in my paper and the reality in practice.

The most impressive part of the trip was the ecosystem surrounding Lake Ichkeul. Due to the erection of dams around the lake, the ecosystem had heavily been affected leaving wild life, flora and fauna endangered; however, it is marvelous to get to know how the ecosystem has been restored.

3.2 What I learned from the Internship to France and Tunisia

Wei YANG

During the Tunisia and France Internship, we focused on water-ecosystem- environment problems, and also learned about human health, which is strongly related to the environment in which we live.

- We learnt how to communicate with different people. We should be broadminded because we could meet different people, some of whom are not kind, or they may have some prejudices. I think how to communicate effectively is a basic requirement for an environmental diplomatic leader. From the internship I could find out weak aspects of my communication skills when I interacted with other people.

- Different regions have different types of environmental problems and human health issues relate to local environment and climate. Tunisia is a water scarce country; local people make effort as they can to solve their problems based on their economic level. They constructed reservoirs and tanks, and take underground water for household, industries and agriculture. They set up the technology and management system for good quality water and sufficient water supply.

- However, I think there also some problems that need to be solved in the future. If too many reservoirs are constructed, it will lead to some ecological environmental problems in the downstream area, such as a decrease in plant cover and taking too much underground water will lower the level of underground water, it could affect the local ecosystem. According to the report of the national water distribution utility of Tunisia, the leakage rate of the water supply system was about 20%. It is much higher than other countries. So I think it is necessary to find out the reason for such a large leakage rate, and create solutions to solve this problem. Introduction of appropriate technology and management of the water supply system is a good choice. Except that, it is also necessary to introduce some water saving technologies for industries, household and especially for agriculture.

- Tunisia is a developing country, the financial market is not perfect and so it will need

sustainable financial support when introducing new technologies and management systems. The cooperation with international organizations and developed countries is so important in solving financial problems.

- One serious problem was that solid waste was piled up everywhere, and the rivers near cities were polluted, which provides a good environment for bacteria, viruses, and parasites to infect humans through mosquitos and other insects. The out dated water conservancy facilities could not overcome flood threat, and after the flood the infectious disease will spread.

- The local people have low environmental awareness. It is necessary to set up a better education system for environmental protection, and also the government needs to enhance the construction of infrastructure such as roads, water conservancy facilities, environmental hygiene structures and so on.

- Sustainable economic growth is a guarantee for environmental protection, and no peace is reflected by limited economic growth. So we hope the revolution will be over as soon as possible.

3.3 After the internship

Ding Dahu

In the seven days, I learned a lot from this great internship.

First of all, I would like to give my thanks to the EDL program and all the staff especially Wakasugi sensei and Takeuchi san. In fact, I am lucky because I should have participated in the EDL international internship last year. However, I missed it due to research commitments. This year, I was chosen as a member of the France &Tunisia internship. This internship is a relatively interesting one compared with the other two internships, because it contains 2 different countries in 2 different continents. This program is very intensive because we visited so many places and institutes in around 1 week. I appreciated the efforts made by Professor Jamila and Mr. Yahata, also our friend Professor Anis and their careful and excellent plan for this internship. I would like to comment about what I learned from this internship. I am afraid I could not understand everything correctly because there is so much knowledge to be learned in this internship. I would like to summarize the most interesting topics from the internship.

1. I would like to comment on UNESCO and Paris. I heard about UNESCO along time ago and knew matters such as world heritage were evaluated and determined by UNESCO. Nothing else. Through this trip, I learnt UNESCO does a lot of work on water issues. Also, there are many projects undertaken to improve water quality and world water day (22 March), which I heard during my undergraduate period is also overseen by this organization. I am thinking about the possibility of linking with UNESCO projects because the organization has some projects incorporating water quality and wastewater treatment. This would be exciting and I think this is possible in the future. I have heard and seen from books and TVs about Paris, the Eiffel Tower and the Louvre museum many times. Thanks to this internship I have been able to see them. They are so different to Asian buildings and really brilliant and magnificent and made a deep impression.

2. I learned many things from the Sidi El Barrak dam visit. I had an idea about the dam's effect. Generally, construction of a dam incorporates economic, social and environmental aspects. The former two would be generally beneficial because they can control flood and water supply. The last one is almost negative. However, in this case, the dam could control the Ichkeul lake and

wetland ecosystem. This idea is really interesting and could give us some new things to learn about and consider. The dam is next to the sea, which is special.

3. The director of APEL association indicated they tried to train local residents to change their living behavior in order to reduce solid wastes and protect groundwater. As she mentioned, a small change might be a big challenge. I really agree with her, they have a long way to go. During the internship in Tunisia, we saw much solid waste on the sides of roads, which is a hard job for any developing country, especially in rural areas. This problem also exists in China. I think I would like to make some effort on this topic in future if possible.

   Finally, I believe this internship was an unforgettable and valuable experience in my life.

3.4. New things to Learn during the internship

Bui Thi Tuyet Van

The international internship was a wonderful opportunity to visit two places namely Paris and Tunisia, representative of the two continents (Europe and Africa).

In Paris, after visiting UNESCO and the Pasteur Institute, I could understand the roles, objectives, and activities of these environment-related international organizations. These organizations focus on all global, national and regional activities. UNESCO organizes four sections related to water such as the international hydrology program, world water assessment, water education and water centers which research the relationship between the water and population, water and climate change. In the present context of rapid population growth and globalization, UNESCO tries to supply enough safe drinking water and sanitation, and how to increase the waste water treatment to 90%. Particularly, I could understand the close relationship between France and Vietnam after visiting the stamp exhibition.

At the Paris Water Authority, the best thing they did was to fix the price of water for 5 years. That is of great advantage to control the water quality and the water consumption. In this area, tap water is good quality because of the use of advanced technology; and local people or tourists can drink tap water directly. This is different from where I live in Ho Chi Minh City. There are some companies supplying water with different price sand varying quality. This is why local people in Ho Chi Minh City feel confused and over exploitation of groundwater occurs.

In Tunisia, I learnt more about environmental problems. Firstly, the construction of the dam had positive and negative influences. In detail, this dam supplies drinking water for a huge area and helps to control salinity and flood. On the other hand, the dam construction changed the ecosystem. It is necessary to implement an environmental impact assessment before constructing any new project. Secondly, the cooperation between the regional hospital and the regional department of Hygiene and Environment Protection in Jendouba is good because there is a close relationship between insects, diseases and environmental risks. Therefore, the hospital and the department can control the appearance of some new diseases after disasters. The final comment is to use and relate the urban water issues in Paris and Tunis to this problem in the case study in my research.

3.5 Taught of the Internship.

Miah Md Tofail

The Internship in France and Tunisia was a great trip indeed and I am privileged to have participated. It was a great opportunity for me to see water, environment and public health issues throughout the trip and certainly I have learned a lot from this internship.

Being an educational, scientific and cultural organization of the United Nations how UNESCO deals with report publication, water education, enhances knowledge, arranges conference and meetings and discusses possible solutions is important. A significant task that UNESCO undertakes is to make data available from researchers to policy making to solve regional and local problems.

In side UNESCO there is statue that depicts “one planet one ocean”. Conservation of global bio-diversity including oceans is very important for humankind. Only technology cannot achieve sustainable development. Our attitude should change as well.

Fig. One Planet One Ocean inside UNESCO

Louis Pasteur opened a new era in microbiology by discovering vaccination in 1880. Still the Pasteur Institute's mission is expansion and significantly working to identify and intervene new emerging diseases.

In Tunisia farmers are vulnerable to LCZ (Leishmaniasis Cutaneous Zoonotic) since they live in the same location as the vector due to agricultural purposes. Agricultural activities provide favorable moisture conditions for the mosquitos. Leishmaniasis is transmitted to the human body by the vector P.Papatasi (mosquito) and causes severe skin sores and women are more vulnerable. However the parasite lives on *Meriones shawi*.Professor Dr. Issam Nouiriof INAT showed in his research that farmers will be at less risk of exposure to LCZ by cutting the chain of parasites transmission cycle by changing irrigation technique or destroying the habitation of vectors.

Institute of fisheries and aquaculture in Bizerte how baby oysters are nurtured in hatcheries and then sold to private firms. They are imported from Korea, Italy and elsewhere and they try to modify the oysters genetically so they adjust to the local environment.

Since the 1970's the Sylvo pastoral institute has focused with forestry and grazing by undertaking research, particularly on medicinal plants and report their findings to the forest ministry. So far, they worked on 230 types of medicinal plants and found a very strong relationship with environment and human health.

We saw an effective NGO CIFDER under APPEL that conducts training and research. They train people to improve their standard of living along with building environmental awareness. They play a role in reducing poverty to some extent because they have more direct access to local people than government agencies.

We saw oak trees in the kroumire mountain ecosystem that are very unique to the Mediterranean area. How oak bark is made into cork is a very intrinsic method and very important for Tunisian trade and economy. Another important feature is that they have nature clubs in different schools which are needed at the present time. If children know about nature and environment then in future they will play a vital role in conservation.

The Jendouba Department of Hygiene and Environment protection of deals with so many essential issues like microbiology, water quality control, air pollution and waste treatment. They are also concerned about controlling food products by checking the presence of toxic substances. Another effort is to manage risk by controlling hazardous material and pesticides in vegetables. The other important aspect they monitor is the relationship between insects and diseases. Vectors are directly connected with diseases and significant for human health and the environment. Above all their top priority is hospital hygiene and we saw their efforts in Jendouba regional hospital.

Fresh water is very important and has been from the early stages of civilization. In Carthage, a 132 km long aqua duct was built to carry water from Zaghouan to Carthage. This aqua duct was built by the Romans around 130 AD.

Fig. Zaghouan Aqua duct in Carthage, Tunisia

Since 1968 SONEDE under the Ministry of Agriculture and Hydraulic Research is responsible for the supply of water in Tunisia. They manage 100% of the water supply in the urban areas and 48.7% in the rural areas. SONEDE established 21 treatment plants (including 4desalination plants and 5 iron treatment plants) throughout Tunisia. What is noticeable is only 3 plants have been established since 2001. They monitor quality in their central and regional laboratory by collecting 49000 samples per year for bacterial tests and 2000 samples for physical property testing.

We visited the humid coastal area of Lake Ichkeul's ecosystem In Bizerte, Tunis which is very famous for flora and fauna consists of three parts; lake, hill and marsh land. In 1996 due to dam construction in the north-west a lot of problems happened in the area. Birds, fish including aquatic species were significantly affected due to a shortage of runoff water.

Lake Ichekeul somehow restores its ecosystem through multidisciplinary activities. So in case of any environmental degradation we should look for alternative solutions and proactively mitigate the situation. Definitely each and every problem has a possible solution. What we need to do is to give our best effort to discover appropriate alternatives.

3.6 Impressions from the internship

Aleksejeve Jelena

1.1. UNESCO

We started our internship in France, Paris and immediately could feel the difference between cultures, the Japanese culture, that we were accustomed to through our studies, and European culture. For me it was an emotional experience as I was close to my own country and due to the similarities with my own culture, it felt like home.

On our second day of the internship, we visited UNESCO headquarters. As all of us are in the environmental sciences program, this visit was a truly valuable experience as this is the organization we look up to and aspire to join given the opportunity. At first, we had a presentation by Dr. Sarantuyaa Zandaryaa who is a program Specialist in the Division of Water Sciences at UNESCO. According to Dr. Zandaryaa UNESCO at present is mainly focusing on water security and gender equality issues. Given the fact that 900,000 people do not have access to safe drinking water and as many as 2. 5 million people live without sanitation, water issues are included in the Millennium Development Goals, and are planned to be included in the Sustainable Development Goals which will follow the MDGs. Water problems are addressed under many programs with only one program, the International Hydrological Program of UNESCO, dealing with fresh water. The world is facing an ever-increasing water demand, which leads to increase in wastewater. According to information given by Dr. Zandaryaa, in countries with poor waste water management water is being directly discharged into water bodies. This, in turn, leads to the problem of eutrophication and water purification plants are unable to treat water with high eutrophication levels. Roughly 90% of all wastewater in developing countries is discharged without being treated. In recent years, another dire problem was added to the list – the effect of climate change on water and water sources. For the reasons stated and many others attention has shifted from water scarcity to water pollution, with high chances of it becoming one of the SDGs.

The presentation gave us a lot of valuable information on the water situation in the world with a focus on developing countries. Some information was new to us and it was truly thought provoking.

As the second part of or visit, we were given a short tour around the building. There are policies with respect to the building itself, one of them being the requirement of having windows in every

office room. As we went on with the tour, we could not help but notice numerous art pieces. According to the guide, UNESCO HQ possesses 700 pieces of art all of which are donations and presents by many Member States. They include the art of Picasso, Tapies, Miro and many others.

We were also able to enjoy our lunch at the organization's canteen, where we could feel the atmosphere of the workplace. It was interesting to see so many people, speaking in different languages, discussing global issues over lunch. Even though this part of the day might be considered trivial, I believe for us it was an inspiring experience.

We were able to experience UNESCO headquarters in person, not just learning about it from the Internet and books. This was a memorable experience.

Painting by Picasso in UNESCO HQ

1.2. Eau de Paris

We visited Eau Paris where we were given a short presentation and had the chance to ask questions that concerned us. My personal interest was in the recent restructuring of the water supply system in Paris.

Q: "What are the benefits of the restructuring of the water supply system?"

A: "Before the remunicipalization, 12 organizations were involved in water management. Restructuring has made management more transparent and easy to manage. It is also because of

this that water prices are decreasing as there are fewer institutions involved and thus less corruption and more control over price setting. Since 2010 the price of water has decreased by 10% and the price is now fixed for the next 10 years".

Paris' current water service is as follows:

- 2.2 million inhabitants
- 3.5 daily consumers, including commuters and tourists
- Daily consumption of 550,000 m3
- 470 km of aqueducts
- Water supply network efficiency 95%; leakage rate 5%
- 50,000 water samples analyzed every year

After the presentation we had a tour around the building that had an exhibition related to water management and supply. It was interesting to learn that water is transferred to Paris in an energy-saving way using the natural elevation of the area i.e. water flow from higher area to lower. In uneven areas, where elevation suddenly decreases, bridges supporting the pipes are constructed. The pressure in such places is also regulated through the utilization of narrower pipes. This provides high pressure and water flows from uneven elevation areas without hindrance. It takes roughly 2.5 days for the water to reach Paris from its source.

Supply of water to Paris from higher elevation points:

Source: Eau de Paris

It was also interesting to find out, that Eau de Paris does not use chlorine in the water treatment process. However, it is added after the treatment to account for possible contamination that might occur in the pipelines on the way to consumers' taps. We were told that roughly "1 drop" of chlorine is added per 1000 m3 of water.

Water demand has slightly decreased for several reasons. First it is due to improvements in the supply system by fixing the leakage rate. Other reasons include smaller apartments, "smart" technology in home appliances, people's awareness and fewer children per family. During the daytime water demand in Paris drastically increases because of water places located in Paris and tourism. Water is also drinkable from water fountains on the streets of Paris and there are currently 1000 fountains installed. The organization is also responsible for informing people and tourists of the safety of water; that there is no need to purchase bottled water or boil it before consumption.

1.3. Impressions of Tunisia

During our stay we learned a lot of interesting facts and gained deeper understanding of the country's water situation as well as health related topics.

It was interesting to learn in more detail the situation of Leishmaniasis Cutaneous Zoonotic in relation to water and irrigation. Climate change has a big impact on mosquitos' habitat expansion. Exposure to mosquitos is higher in humid areas and during the night. We were told that in most cases farmers have to pay for the water before they use it and often are not able to decide on the time of irrigation as this is decided by the farmers' association. This makes the situation more severe as many farmers have to resort to irrigating during the night. This leads to exposure to both factors, being in a humid area at night.

We have also learned about forests in Tunisia. It was fortunate to find out that Tunisia does not have a problem with deforestation due to human activity. Most timber is imported and it is not popular as a material in Tunisia. Most of the forests in Tunisia are natural. There were attempts in planting trees as well, however the plantation area is insignificant. There is an increase in forested area as more and more people move to urban areas due to the lack of sustenance, therefore the forest is naturally increasing, so far by roughly 12%.

Forest is mainly used for non-timber products such as medicinal plants. The quality and effect of medicinal plants depends on the area and soil it grows in e.g. it is usually more productive in the Southern part of Tunisia. According to research, women are savvier with medicinal plants than men. However knowledge is becoming lost. Younger generations do not use medicinal plants as much as people used to in the past.

1.4. Tunisia after the revolution

One cannot help but be curious about the situation of the country after the revolution. Sadly, it seems that the country is declining in its wait for the new constitution and political stability. The most stunning point was the amount of trash literally everywhere on the streets. During our visit to the Institute of Fisheries and Aquaculture in Bizerte, I had the chance to talk with one of the students about the situation in the country. She expressed her concern for the environment as the trash keeps piling up in every area of the country. When it decomposes it poisons the surrounding area and seeps into the ground water. She also said that the people are hopeful and are patiently waiting for the new, democratic government to form.

The internship was a valuable and unforgettable experience. We learned many things, and more importantly were able to see it for ourselves and interact with the country's people who kindly answered our, sometimes silly, questions with patience and great interest. We were also able to experience the atmosphere of a country after a big change. I wish all the best to Tunisia in its endeavors and new outlook and hope to visit again.

3.7 About the internship

Nguyen Thi Tam

I had a great time in both Paris and Tunisia. I learnt many things from the lectures as well as experiences shared by professors and staff. I visited many places and all impressed me. In three places I learned many things from their activities and programs.

First, UNESCO World Heritage Centre; this center was established in 1992 and is the center for all matters related to World Heritage. The lecture on water issues at UNESCO gave me lots of information about activities, programs as well as plans for water solutions by UNESCO. However, my friends and I recognize one significant problem which should be thought deeply of now and in the future, that is how to link scientific work and policy making, how to cooperate between scientists and policy makers.

Secondly, I was concerned about the High Institute of Fisheries and Aquaculture in Bizerta, Tunisia. They have various aquaculture production systems. In my mind, there are both positive and negative points of this system. They can create and provide local conditions suitable for aquaculture farming. However, the negative side is it is very difficult to keep the original variety and its special characteristic will disappear in the near future. One another problem I found is there is no water treatment established. Waste water from the production system is discharged directly into the sea. Sea water is under the threat due to this problem.

I was especially impressed about medical waste treatment and collection at the Jendouba, regional hospital in Tunisia. One hundred percent of medical waste is treated according to the environmental field staff of this hospital. This information is different from what I got on the internet. This field trip helped me open my mind and check information again.

In conclusion, I found both innovations and problems occurring from their activities. I learnt many lessons and experiences in environmental management in Paris and Tunisia and they are very helpful for my future work.

3.8 My Impression of the Internship

Erdenebadrakh Munkhjargal

The France & Tunisia internship 2013 was held between September 19 and 27, 2013. In this internship Professor Naomi Wakasugi, and nine foreign students studying environmental science participated.

The first three days we stayed in Paris. The objective of the France internship was to understand the activity and structure of international organizations such us UNESCO and the Pasteur institute and introduce urban water issue in France.

On the first day, in the morning we visited UNESCO and had a meeting with Dr Sarantuyaa Zandaryaa. She is a programme specialist in the urban water systems section SC/HYD/UWS. She gave us lecture on Water Quality for Human Well-being and environment. She explained about environmental and main water issues, global networks, national community, activity, cooperation and the plans of UNESCO. I would like to thank Dr Sarantuyaa Zandaryaa, for giving us a very interesting and useful information on global environmental trends and I am very proud of her (See figure 1). Then we had a guided tour of UNESCO. In the afternoon we visited the Paris Water Authority. There we had another meeting which outlined the Paris water service and the re-municipalization of water utilities. Then we visited the Paris water museum and learnt much regarding the history of water such us how to distribute water to public, facilities and structure of the equipment and pipe line (See figure 2).

Figure 1, 2. Lecture of in the UNESCO and Paris water museum

After we visited the Pasteur Institute and listened to a short presentation of the role of the institute, its history…and so on. There was a special event regarding a common issue between France Vietnam of a new stamp of Alexander Yersin.

Next day was Saturday and until 5 pm we had free time. We went to visit a lot of sightseeing places in Paris and enjoyed a full day. I was very excited and feeling wonderful. Ones again I appreciate Professor Naomi Wakasugi for giving us the opportunity to see old Europe.

We left Paris on 21 September 2013 and arrived in Tunisia in the evening. Tunisia is the smallest country in North Africa. Tunisia has great environmental diversity due to its north-south extent. Its east-west extent is limited. We stayed in the northern part of Tunisia. This part is mountainous and borders the Mediterranean Sea.

The next day morning we visited INAT. We had a seminar and for the first hour Dr. Issam Nouiri, National Institute Agronomy of Tunisia gave us a lecture regarding analysis of the water irrigation process and its impact on farmers. Then we discussed the above issue and asked questions about this research and improved and exchanged knowledge (see figure3). In the afternoon we visited of the archeological site of Carthage. Carthage was founded in the 9th century and is an extensive archaeological site, located on a hill dominating the Gulf of Tunis and the surrounding plain. (see figure4).

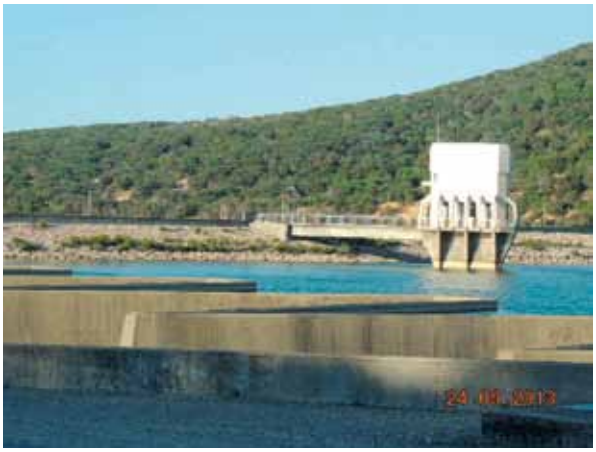


Figure 3: Historical place of Carthage Fig 4. Sidi Al Barak Dam and Reservoir.

On 23 September we visited the “Ichkeul” Ecosystem. It is a UNESCO World Heritage Centre and this place is a major stopover point for hundreds of thousands of migrating birds. Next we visited the High Institute of Fisheries and Aquaculture in Bizerta and later Sidi El Barrak dam.

We spent 5 days in Tunisia and visited so many interesting places such as the Jendouba Regional Hospital etc.

The France & Tunisia EDL international internship 2013 focused on ecological equilibrium particularly in relation to water issues such as water scarcity, good solutions, the effect of water problems and its connection with biodiversity.

As we know climate is already changing and we cannot stop it but we can adapt to changing environmental conditions. In another words, all activity and developments are what we saw, focused on adaptation management.

In this internship was a big experience for us to understood water issues. Water problems are occurring every way, for every person, every country and even in Paris. It is a global vital problem and it is our job.

3.8 Impressions during walking in Paris

Ding Jielu

From 20 Sep to 26 Sep, I was very glad that I had a chance to visit France and Tunisia. And during these 7 days, I was interested in learn the situation of water resources and public health in those two countries. However the most impressive part during this internship was that it allowed me to experience the lifestyle of Europe and Africa.

The first day in France, we visited the international organization UNESSCO and Paris Water Authority. At UNESCO, we not only attended a presentation related to water resources, but also visited many places in the UNESCO building. During the presentation, we heard that UNESCO has many programs to help countries which have serious water pollution, or where water resource are scarce. I think the program is very meaningful and helpful to these countries, however I sincerely hope that UNESCO can make more effort to intervene in countries which have serious pollution, or to mediate between two countries regarding water. Now most of work done by UNESCO is to invest in water quality in several countries, and to advise those countries how to deal with water pollution. In some countries in order to increase their GDP and development, the attention paid to environmental protection is very low. I think some beautiful scenery, or species, once disappeared from the world will never come back, so some pollution in nature is irreparable. We should strengthen management to prevent this things happening so frequently. So, just to rely on countries themselves to manage water resources, the effect is limited. The visit to Paris Water Authority also left me with a deep impression, particularly the sewage system. I appreciate its aesthetic and practical side very much. Every time I saw this type of architecture, equipment or system, it always reminded me of these facilities in my country. Although some of them are also very good, I think the architecture, equipment or system needs to be improved to make them, more high tech and more aesthetic.

The second day in France was free and, at first I planned to visit some tourist attractions. Finally, my friend and I decided just to saunter around the Paris streets just to give us an idea of the Paris life style. In the morning in China and Japan, all I can see is people rushing to the subway or bus station, especially in Japan, nearly all of those people wear suits, and the scene seems very neat. However, the scene in Paris is totally different. Most people walking in the street do so leisurely. In

the bread store where I ate my breakfast, I saw fathers' or mothers' bring their children to enjoy their breakfast; the atmosphere is so relaxed and comfortable. Walking along the street, I can see many open, small size restaurants, with people just sitting there, buying a cup of coffee and breads and chatting with each other. I felt the people living in Paris and Tunisia have more free time in their life. For example, in Tunisia, our schedule is late in one day, the people who would guide us felt very tired because it is outside their work time. When I checked my watch, I saw it was just about 17:00. In contrast, some Chinese and Japanese friends who work told me that overtime is normal and to work overtime without payment is common. At first, I didn't think overtime is a strange thing, but this internship showed me there is another lifestyle in the world. This lifestyle can not only exist in developed countries, like France, but also in developing countries, like Tunisia.

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Photographs





UNESCO Headquarter in Paris



Pavilion de L`Eau In Paris



Pasteur institutes in Paris



INAT , Tunisia



Ichkeil Ecosystem Bizerte



Institute of Fisheries and aquiculture, Bizerte

Sidi EL Barrak Dam , Bizerte



APEEL association

Jendouba regional Hospital



Sylvo Pastoral Institute, Tabarka **JICA, Tunis**



SONEDE, Tunis



Wrap-up meeting , Tunis **See off from Tunis**











Sightseeing in Paris






Sightseeing in Tunis

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2013 EDL Internship in France and Tunisia Participants